

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#29/120E
9/15/03

In re application of: Mathew et al.

Serial No.: 09/494,837

Group Art Unit: 1733

Filed: 01/31/00

Examiner: J. Aftergut

(NE)

For: METHOD OF MAKING FLUOROCARBON COATED BRAIDED HOSE
ASSEMBLIES

Attorney Docket No: 0153.00084

AFFIDAVIT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

I, Norman S. Martucci, being duly sworn, do hereby say that:

1. I am co-inventor of the above-captioned invention.
2. I am skilled in the art of hose construction and have worked extensively in the development of a hose assembly, including coated braided hose assemblies and methods of manufacturing the same.
3. Teleflex, Inc., the Assignee of the presently pending application, manufactures a hose assembly, as disclosed in the above-captioned patent application that is formed by first "dipping" a hose assembly in dispersion, then affixing a braid to the exterior surface of the hose assembly. The braided hose is then "dipped" in the dispersion again to ensure that the braid is affixed to the surface of the hose assembly. The first dispersion allows the braided layer to be bonded to the inner liner and a second dispersion or dip helps maintain the bond strength of the braided layer to the inner tube inner liner. The process described is known as the "double dip" process and the process creates a

hose assembly that is extremely bendable and overcomes problems of uniformity of bonding and increased flexibility that are found in the hose assemblies formed using methods described by the prior art. The hose formed using the "double dip" process is more flexible and bendable because the interstitial spaces, spaces between the fibers of the braid, into which the second dispersion flows form anchor points between the braid and the hose assembly.

4. European patent 439898 discloses a method of forming a hose assembly by braiding previously coated fibers on the exterior surface of a hose assembly. The method merely bonds the fibers and then includes one dipping step for dipping the entire hose with the braid included thereon into a dispersion. The method does not result in increased flexibility of the tube and actually forms a more rigid hose assembly. The hose is more rigid because the entire length of fiber forms an anchor point between the braid and the hose assembly.

5. It was unexpectedly found that the "double dip" method of the presently pending application produces less variation in the strength of the bond and also is unexpectedly more flexible than the hose assembly of the European patent application. The hose formed by the methods disclosed in the European patent application instead are more rigid than the hose assembly of the present application. Further, the European patent only teaches a single dip method of forming a hose assembly as can be found in other hose assembly patents such as United States Patent No. 5,142,782 wherein Teflon hoses are extruded, a braid is applied to the exterior surface of the Teflon hose, and a dispersion, including a fluorocarbon polymer material, is applied to the braid hose assembly. As is shown in the attached data, this single dip method does not provide the higher bond strength and flexibility found in hoses made by the "double dip" method of the presently pending application.

6. During testing of the hose assembly formed by the method disclosed in European patent kinking was found in the hose assembly. The kinking was formed because the hose assembly was too rigid. The hose assembly was too rigid because the

fibers making up the braid had too much strength as a result of being dipped prior to being braided and applied to the inner liner of the hose. The hose assembly formed using the methods disclosed in the European patent was repeatedly tested and during all of the tests the same results occurred, that the hose would kink and thus could not be used in a fuel line. The bond between the fiber and the inner liner is extremely strong in the hose assembly formed using the method disclosed in the European patent and as such it creates a very rigid hose assembly that kinks when the hose assembly is bent. Thus, the problem with the hose assembly of the European patent application is that the bond between the braid fibers and the inner liner is too strong, not that the bond is not strong enough. It is this increased strength at the anchor points described above that cause the hose to kink.

7. The following data presented in the attached exhibits demonstrate the unexpected results obtained by the "double dip" method of the present invention. Referring specifically to the attached exhibits, the document dated 9/8/92 shows data for single dip. The document dated 9/9/92 for Part No.: TFH-1001-060 shows a peel strength for the single dip to be 7.41 pounds plus or minus 1.26 pounds. Hence, there is great variation and higher peel strength. The document in the form of the table dated 6/11/96 and entitled 1995 Peel Data For TFH-1002-050 shows the uniform peel strength data for the tubes resulting from the "double dip" process. The peel strength is lower (between 3 and 4 pounds) but the variation is tighter than that of the single dip process.

8. Automotive customers have made the "double dip" hose of the present invention a significant commercial hose device based upon the characteristics of the "double dip" hose having less variation in strength of the bond and being more flexible.

The undersigned declares further all statements made herein of his knowledge are true and that all statements made on information and belief are believed to be true; and further that the statements were made with the knowledge that willful and false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Norman S. Martucci

Date: September ____, 2003

STATE OF MICHIGAN)
) ss.
COUNTY OF MACOMB)

On this _____ day of _____, 2002, personally appeared before me, NORMAN S. MARTUCCI to me known to be the person named in and who executed the above instrument, and acknowledged that he executed the same for the uses and purposes therein mentioned.

Notary Public

My Commission Expires: